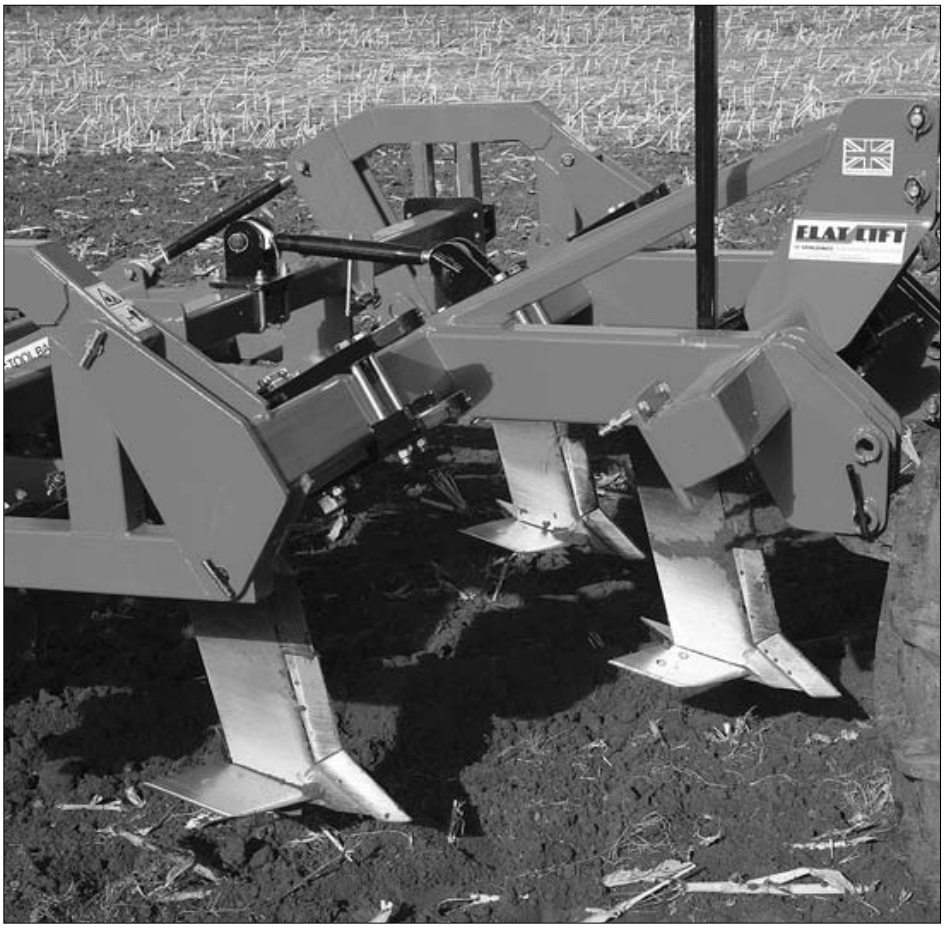
FLAT LIFT®

CE

Operating Instructions



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Section 1

INTRODUCTION

CONTENTS

1 INTRODUCTION
1.0 Identification 1
1.1 Warranty 1

2 SAFETY GUIDELINES
2.0 Symbols 2
2.1 Understanding the safety symbols 2
2.2 Before use: 3
2.3 During use: 3
2.4 After use: 3
2.5 Always: 3
2.6 Never: 3

3 MAINTENANCE
3.0 Lubrication and maintenance 4
3.1 Shear bolt protection 4

4 OPERATING INSTRUCTIONS
4.0 Connection to a tractor 5
4.1 Adjusting the working depth 5
4.2 Working speed 5
4.3 Discs 5
4.4 Packer rollers 5
4.5 Checking for wear 5
4.6 General working hints 6

5 SPECIFICATIONS & OPTIONS LISTING 7

6 PARTS LISTING 8

7 OPTIONS
7.0 Spiked packer roller 9
7.1 Depth wheel assembly 9
7.2 Hydraulic depth control kits 9
7.3 Hydraulic auto-trip legs 10
7.4 Mole conversion kits 10
7.5 Disc cultivation tool bar 11
7.6 Tine cultivation tool bar 11
7.7 Tool bar replacement parts 12
7.8 Air seeding units 13

8 SINGLE-PASS TOOL BARS
8.0 Tool bar to Flatlift attachment 14
8.1 Tool bar operation and adjustment 15
8.2 Tool bar maintenance 15
8.3 Tool bar specification 15

1.0 Identification

You can find the registration number of the Flatlift® subsoiler stamped on the identification label (see Fig.1).

The label contains the following information:
– Address of the Manufacturer,
– "EU" mark,
A Identification number of the machine,
B Model of the machine,
D Weight (kilograms).

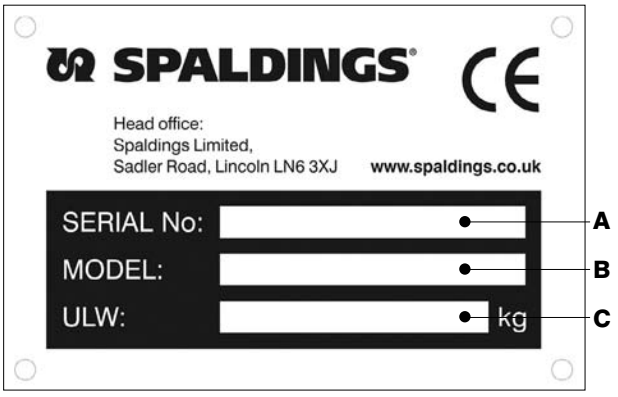


Fig.1 Identification plate

YEAR FRAME 5 WARRANTY

1.1 Warranty

All Flatlift® frames are guaranteed against bending or breaking for **FIVE YEARS** from the date of purchase, providing the implement has not been abused and that no more than the recommended horse power has been used.

This warranty does not cover normal wear such as erosion of paint finish, distortion of linkage pin holes, etc.

SAFETY GUIDELINES

2.0 Safety warning signs

Safety signs are applied to the machine to indicate potential dangers.

The operator must fully understand the warning symbols on the machine:

DANGER
To draw the operator's attention to situations which could endanger his or other peoples safety.

CAUTION
To draw the operator's attention to situations which could affect the machine performance but not his or other peoples safety.

IMPORTANT
To draw the operator's attention to situations which do not affect the machine performance and his or other peoples safety.

2.1 Understanding the safety symbols

Before operating the machine, it is important that each operator understands the following explanations.

Safety symbol	Symbol meaning
1.	**BEFORE MAINTENANCE** 1. Important, carefully read the manufacturers handbook before attempting maintenance.
2.	**DANGER OF FOOT INJURY** 2. Any person near the machine when working must keep a safe distance.
3.	**LIFTING GEAR** 3. When lifting the machine always use appropriate lifting gear attached to the lifting eyes on the machine frame.

Section 2

SAFETY GUIDELINES

2.2 Before use:

- Ensure operators have read and are familiar with the instructions contained in this manual.
- Ensure that the Flatlift® is level and stable. The parking prop should be lowered and support blocks used where necessary.
- Consult the tractor manufacturer's manual for instructions on safe mounting of implements and working methods.

2.3 During use:

- Ensure the Flatlift® is correctly attached to the tractor and the parking prop is raised.
- Be alert to underground obstructions, e.g. tree roots, cables, boulders, pipes, etc. Should an obstruction be encountered, stop immediately and investigate.
- Ensure all persons are well clear of the Flatlift® whilst in use.
- Observe safe driving procedures, e.g. reducing speed on slopes and sharp turns.
- Never turn corners with the Flatlift® in the ground.

2.4 After use:

- Check that all fasteners are tight.
- Carry out all lubrication and maintenance work as detailed in this manual.

2.5 ALWAYS:

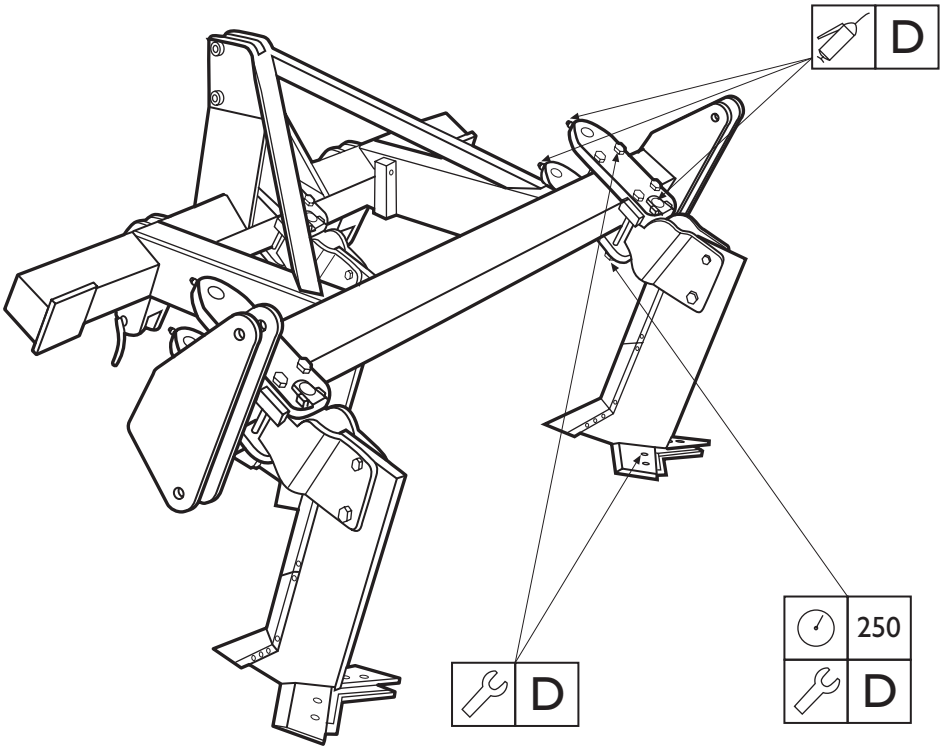
- Wear substantial or safety footwear.
- Wear gloves when handling worn parts with sharp edges.
- Ensure the Flatlift® is not operated by untrained persons.
- Use the Flatlift® only for the purpose for which it was designed and tested and in accordance with the guidelines in this manual.
- Interpret "right" and "left" as the right and left of the operator facing forward in the tractor cab.

2.6 NEVER:

- Carry out adjustments or repairs to the Flatlift® unless the tractor engine is stopped and the Flatlift® is firmly supported or lowered to the ground.
- Leave the tractor cab unless the Flatlift® is lowered, the tractor gear shift is in neutral, the brake applied, the engine stopped and the ignition key removed.
- Allow persons to ride on the Flatlift® during operation and transportation.

3.0 Lubrication & maintenance

Before commencing any lubrication and maintenance ensure that you have read and are familiar with the safety precautions at the front of this manual.



KEY TO SYMBOLS

All models

TIGHTEN NUTS AND BOLTS

GREASE

TORQUE 1 bf/in. (SPECIFIED)

DAILY

3.1 Shear bolt protection

The Flatlift® swivel tines are shear bolt protected except on hydraulic Auto-trip legs.

When replacing shear bolts, all adjacent parts such as shear bushes and hinge plates must be checked and replaced if worn.

It is essential to use the shear bolts specified, failure to do so will invalidate any subsequent warranty claims.

FAILURE TO USE GENUINE SPALDINGS SHEAR BOLTS MAY INVALIDATE LEG WARRANTY

Section 4

OPERATING INSTRUCTIONS

4.0 Connection to a tractor

1. Back the tractor up to the Flatlift®, which should be on a firm, level surface. Position the Tractor lower links in line with the Flatlift® lower mounting brackets.
2. The linkage pin holes selected will depend on the category of linkage, the depth of work, the lifting capacity of the tractor and the height of the tractor three point linkage from the ground. Adjust the tractor top link to fit the Flatlift®, fit the linkage pins and secure using a linch pin.
3. To disconnect the Flatlift® from the tractor, reverse the above procedure.
4. When using the Flatlift® with discs fitted to the front leg, the drawbar should always be removed.

4.1 Adjusting the working depth

Depth is controlled and adjusted by the setting of the top links on the packer roller. In most conditions the Flatlift® frame should be set parallel with the ground, however it may be necessary to shorten the top link if penetration is difficult due to adverse conditions.

4.2 Working speed

Forward working speed is not critical and, in general, the faster the speed the greater the soil shatter effect, but this is obviously dependant upon all the many factors that can affect the soil and working conditions.

SPECIAL NOTES

1. The swivel action of the tine is designed to cope with side stresses caused by soil expansion and allows the tines to pass around limited obstructions.
2. **The Flatlift® is not designed to be turned whilst in work. Always lift the implement when turning at headlands.**

4.3 Discs

Discs are recommended for working in grass or heavy trash conditions. Discs can be fitted to all the current range of machines and can be supplied either as original equipment, or later as required.

Discs can be adjusted for depth independently by slackening the disc clamp screw and raising or lowering the disc. The clamp screw must be securely tightened onto the disc post before commencing work.

4.4 Packer rollers

Packer rollers are available for all models. Please refer to pages 7 and 9 within this book.
For further details contact your local Spaldings representative or telephone our Sales Office: 01522 507600
or email: agsales@spaldings.co.uk

4.5 Checking for wear

The operator should check the tine wearing parts frequently and should replace worn items as follows:

POINTS
Change prior to side or underside of tongue wearing.

WINGS
Change prior to side or underside of wing bracket wearing.

SHIN
Change prior to side of shank wearing.

4.6 General working hints

WORKING REQUIREMENT	TINE CENTRE SETTINGS
1. Very thorough soil shatter. Working in light soil.	– Set tine centres closer.
2. Deep or shallow work in soil that may be liable to excess surface disturbance due to over cultivation.	– Set tine centres wider.
3. Work in highly compacted areas, e.g. tramlines, potato row bottoms and trailer wheelings.	– Set tine centres wider.

HEAVY LAND

When working deep in some very difficult heavy land, with limited horse power, it may be necessary to remove a tine or work the land at a shallower depth in one direction then cross the land, working at a greater depth.

PENETRATION

In most conditions the Flatlift® frame should be set parallel with the ground, however it may be necessary to shorten the top link if penetration is difficult due to adverse conditions.

Section 5

FLATLIFT® SPECIFICATIONS & OPTIONS LISTING

Both 2.85m and 3.5m width Flatlifts can be fitted with a range of machine options; spiked packer roller, discs, cultivation tool bar and seeding unit, for increased choice and flexibility.

PROD. NO.	DESCRIPTION	FRAME WIDTH	WEIGHT	LINKAGE CATEGORY	WORKING DEPTH	WORKING WIDTH BETWEEN mm	WING SIZE mm
FLATLIFT MACHINES							
2.85m width							
12825	3 Leg	2.85m	638kg	cat. 2 & 3	up to 43cm (17")	762 – 838 (30 – 33")	150 (6")
12906	3 Leg auto-trip	2.85m	872kg	cat. 2 & 3	up to 43cm (17")	762 – 838 (30 – 33")	150 (6")
12977	4 Leg	2.85m	-	cat. 2 & 3	up to 43cm (17")	610 (24")	150 (6")
3.5m width							
12944	4 Leg	3.5m	699kg	cat. 3	up to 43cm (17")	660 (26")	150 (6")
12945	4 Leg auto-trip	3.5m	-	cat. 3	up to 43cm (17")	660 (26")	150 (6")
12791	5 Leg	3.5m	805kg	cat. 3	up to 43cm (17")	762 – 838 (30 – 33")	150 (6")
12907	5 Leg auto-trip	3.5m	1194kg	cat. 3	up to 43cm (17")	762 – 838 (30 – 33")	150 (6")
12947	7 Leg	3.5m	1017kg	cat. 3	up to 43cm (17")	380 (15")	150 (6")
12948	7 Leg auto-trip	3.5m	-	cat. 3	up to 43cm (17")	380 (15")	150 (6")

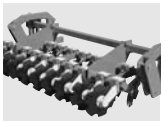
PROD. NO.	DESCRIPTION
AUTO-TRIP LEG KITS	
12903	3 Leg auto-trip conversion kit
12946	4 Leg auto-trip conversion kit
12988	5 Leg auto-trip conversion kit (2 beam)
12905	5 Leg auto-trip conversion kit (3 beam)
12949	7 Leg auto-trip conversion kit

PROD. NO.	DESCRIPTION	TO FIT FLATLIFT MODEL
DEPTH WHEELS & TRASH DISCS		
02188	R.H. Depth wheel	All models
02189	L.H. Depth wheel	All models
12832	Heavy duty trash disc assembly (one required per leg).	All models

PROD. NO.	DESCRIPTION	TO FIT FLATLIFT MODEL	DEPTH CONTROL	TOTAL WIDTH	PACKER DIAMETER	OPTIONAL HYDRAULIC DEPTH CONTROL
SPIKED PACKER ROLLER						
12829	Packer	3 – 4 leg	top link	2.85m	405mm (16")	**02330**
12802	Packer	4 – 7 leg	top link	3.5m	405mm (16")	**02332**

Packer roller to fit pre-2006 3 leg Flatlift: **02288** 2.6m packer.

PROD. NO.	DESCRIPTION	TO FIT FLATLIFT FRAME	CULTIVATION ASSEMBLIES	OPTIONAL CULTI-WING	OPTIONAL DEFLECTOR KIT	OPTIONAL ERAD. TINE KIT
CULTIVATION TOOL BARS						
12960	Disc tool bar	2.85m	10 R.H & 10 L.H disc assemblies	-	**12830**	-
12961	Disc tool bar	3.5m	12 R.H & 12 L.H disc assemblies	-	**12830**	-
12827	Tine tool bar	2.85m	5 tine assemblies	**19077**	**12830**	**12833** (7 tine)
12793	Tine tool bar	3.5m	6 tine assemblies	**19077**	**12830**	**12808** (8 tine)



Tool bars are also available to fit pre-2006 3 leg Flatlift: **12962** 2.6m disc tool bar. **12762** 2.6m tine tool bar.
Disc tool bar conversions are also available to retro-fit to pre-2009 tool bars: **12963** 2.85m. **12964** 3.5m. **12965** 2.65m.

PROD. NO.	DESCRIPTION	TO FIT FLATLIFT MODEL	OIL SEED RAPE SEEDING RATE	HOPPER CAPACITY	SEED OUTLETS
AIR SEEDING UNITS					
Standard Seeder					
12834	Air seeding unit	Flatlift & other 3 – 3.5m subsoilers etc for rape seeding into cultivated top soil	from 2.4 – 17kg per hectare	100 ltrs	4
Narrow Band Seeder					
12950	Air seeding unit	4 – 7 leg Flatlift machines, for rape seeding directly behind subsoil legs	from 2.4 – 17kg per hectare	200 ltrs	up to 8

FLATLIFT® PARTS LIST

ILLUS. NO.	DESCRIPTION	SPALDINGS PROD. NO.

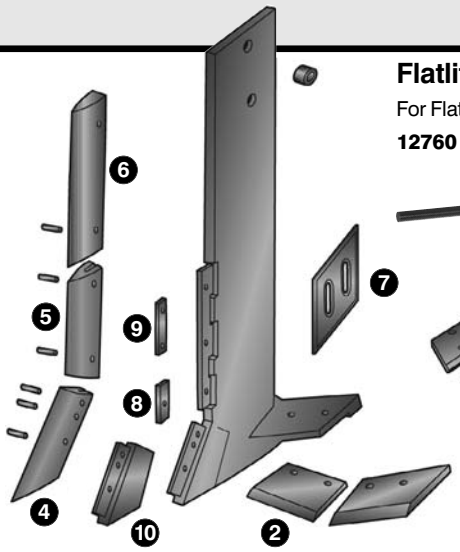
FLATLIFT® LEG ASSEMBLY
Diamond Bar Frames

A and B	Leg assembly c/w swivel box and all wearing parts	**02194**
A1 – 6	Leg c/w wearing parts	**02359**
A1	34" Leg c/w connecting tongue and wing brackets	**02170**
A4	Point	**02154**
-	M10 x 35mm roll pin – fits point & lower shin (Pack of 10)	**02334**
A5	Lower reversible shin	**02153**
A6	Upper reversible shin	**02152**
-	M10 x 25mm roll pin – fits upper shin (Pack of 10)	**02329**
-	Flatlift punch for roll pins	**12760**
A2	6" Wing (2 hole) R.H	**02168**
A3	6" Wing (2 hole) L.H	**02169**
-	½" x 40mm HT Bolt and nut (Pack of 10)	**09216**
A2	**Durafaced®** 6" wing (2 hole) R.H.	**D2168**
A3	**Durafaced®** 6" wing (2 hole) L.H	**D2169**
-	½" x 40mm HT Bolt and nut (Pack of 10)	**09216**
A7	**Durafaced®** weld-on leg wear plate R.H. (190 x 190mm)	**D2016**
A7	**Durafaced®** weld-on leg wear plate L.H. (190 x 190mm)	**D2038**
A8	Weld-on lower shin tongue (Pre 2000 legs)	**02261**
A10	Weld-on point tongue	**02276**
A9	Connecting tongue (Pre 2000 legs)	**02175**
A11	Weld-on wing bracket unit (2 hole) R.H. & L.H. complete	**02171**
A12	Leg bush	**02287**

FLATLIFT® HINGE ASSEMBLY
Diamond Bar Frames

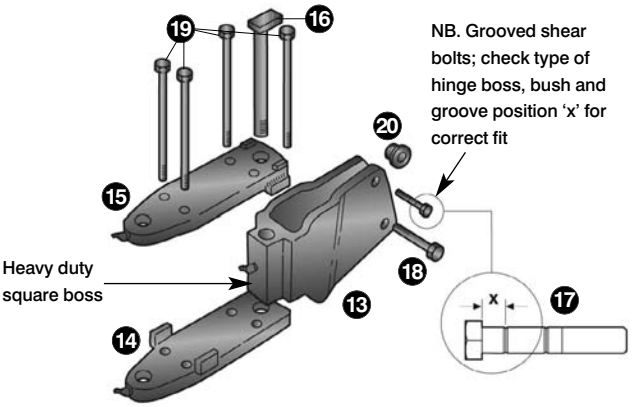
A13 – 20	Hinge assembly	**02361**
A13	Hinge	**02178**
A14	Bottom clasp plate	**02180**
A15	Top clasp plate	**02179**
A16	Hinge pin, spring washer and nut	**02182**
A20	Stepped shear bolt bush (for **square** bossed hinge)	**02297**
A17	M16 x 100mm shear bolt (grooved: **x =23.5mm**) for **square** bossed hinge (Pack of 10)	**08719**
A18	Pivot bolt M24 x 130mm (for Square bossed hinge)	**02224**
A19	Clasp bolt M20 x 260mm c/w nut and spring washer	**02181**

A



Flatlift® Punch
For Flatlift roll pins.

12760 ⅜" x 200mm parallel punch.

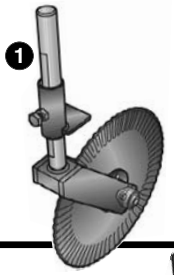


NB. Grooved shear bolts; check type of hinge boss, bush and groove position 'x' for correct fit

FLATLIFT® DISC ASSEMBLY
Diamond Bar Frames

B1	Heavy duty disc assembly (one assembly required per leg)	**12832**
-	20" Fluted disc only	**02207**
-	Disc set screw M12 x 20mm (Pack of 10)	**12836**
-	Disc post arm	**12838**
-	Spindle shaft	**12835**
-	Disc bearing kit for forks	**12839**

B

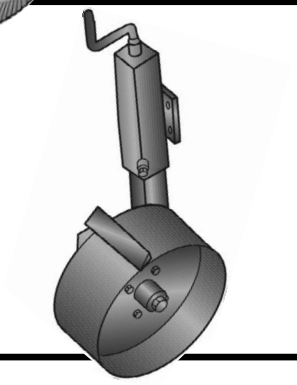


The heavy duty disc assembly will fit all diamond bar Flatlifts. For the perfect finish to grassland or to cut through straw and trash in arable applications

FLATLIFT® DEPTH WHEEL ASSEMBLY
Diamond Bar Frames

C1	R.H. assembly (for 3 Leg Flatlift & post 2008 model 4, 5 & 7 leg Flatlift)	**02188**
-	L.H. assembly (for 3 Leg Flatlift & post 2008 model 4, 5 & 7 leg Flatlift)	**02189**
-	**Depth wheel bearing kit A** 1 x 30206 taper roller bearing (30 x 62mm), 1 x 30209 taper roller bearing (45 x 85mm), 1 x Dust seal (45 x 85mm).	**12756**
-	**Wheel bearing kit B** 1 x 30206 taper roller bearing (30 x 62mm), 1 x 30208 taper roller bearing (40 x 80mm), 1 x Dust seal (40 x 80mm).	**12757**
-	Depth wheel hub cap only	**12769**

C

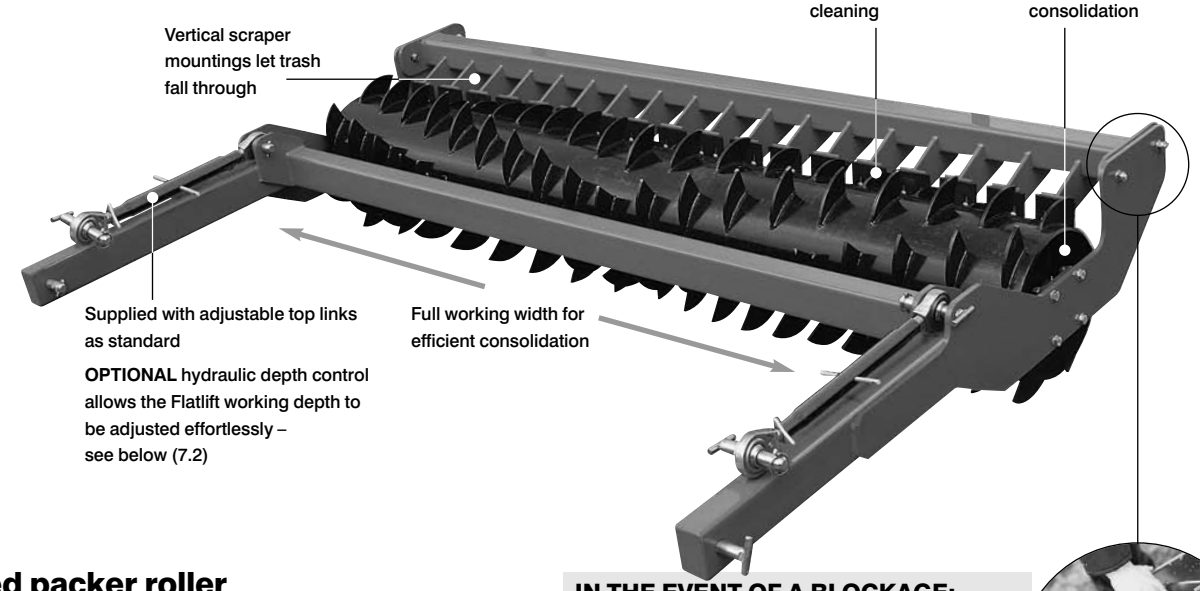


LINKAGE PINS

D1	Top link pin. 160mm Category 2.	**02341**
-	Lower link pin. 170mm Category 2.	**02356**
D2	Top link pin. 160mm Category 3.	**02339**
-	Lower link pin. 270mm Category 3.	**02340**
D3	Lower link pin. Category 2/3 stepped to fit post 2008 model, 3 leg machines	**12957**

D

depth control & consolidation


Adjustable packer scrapers for maximum cleaning
16" Diameter Packer Roller for efficient consolidation
Vertical scraper mountings let trash fall through
Supplied with adjustable top links as standard
OPTIONAL hydraulic depth control allows the Flatlift working depth to be adjusted effortlessly – see below (7.2)
Full working width for efficient consolidation

YEAR FRAME 5 WARRANTY

7.0 Spiked packer roller

The spiked packer roller provides depth control with consolidation and is essential for moisture conservation and rapid seed germination. Suitable for both arable and grassland applications.

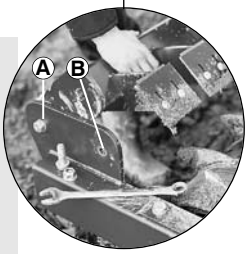
For specification and product numbers see page 7

REPLACEMENT PARTS

02599 Steel scraper (post-1996 models). Single.
18917 M8 x 30mm HT coach bolt & lock nut. Pack of 10.
12958 Packer roller bearing (post-2006 models).

IN THE EVENT OF A BLOCKAGE:

Loosen the rear most bolts on the scraper beam (A), undo the front bolts (B), removing the nuts whilst leaving the bolts in position. Pull on the fully retracted packer stands to take the weight of the scraper beam and remove the front bolts (B) one at a time. With the bolts fully removed pull the stand to swivel the beam over on the rear bolts (A).
Tighten the rear bolts fully to ensure the beam does not move whilst cleaning. Reverse the procedure to return the beam to normal.



De-mountable scraper assembly allows easy access for cleaning

7.1 Depth wheel assemblies

Fitted to the frame, and designed for basic depth control, these units are more often used in grassland applications.

- Allows the Flatlift's working depth to be set without the need of a packer roller

02188 R.H. assembly.
02189 L.H. assembly.

7.2 Hydraulic depth control kits

The conversion kit simply attaches to the spiked packer roller in place of the existing manual adjusting links.

- Allows the Flatlift's working depth to be adjusted while on the move
- Saves operator downtime – less effort needed than with manual adjustment
- Ensures optimum Flatlift productivity as conditions and soil types change
- c/w all necessary fittings and pipework

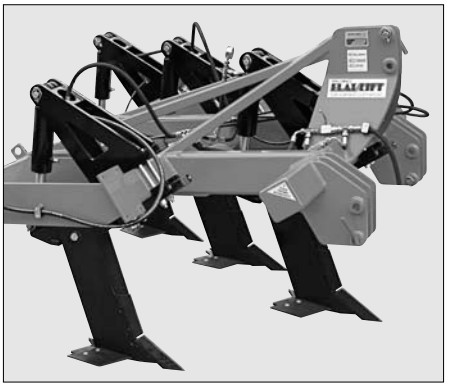
02330 Hydraulic depth control kit to fit 3 leg Flatlift spiked packer rollers.
02332 Hydraulic depth control kit to fit 4 – 7 leg Flatlift spiked packer rollers.

The minimum tractor hydraulic requirement is one double acting spool valve.

7.3 Hydraulic auto-trip legs

The Flatlift® auto-trip leg comes into its own in the more stony and rocky areas of the country; dramatically saving downtime.
No shear bolts means no need to leave the cab – the pressurised system automatically re-sets the Flatlift® leg.

For specification and product numbers see page 7



NO shear bolts to replace!

"Subsoiler trip leg minimises downtime"

Perth-based arable farmer Graham Reid says pressure on autumn workloads and labour availability, coupled with a limited number of days for autumn cultivations means he cannot afford downtime or less than ideal soil conditions for crop establishment.

The Farm's 2000 acres of cropped land has a variety of soil types including heavy clay, medium loam and light lands. Cropping includes winter cereals as well as potatoes and carrots.

"We have tried various one pass systems," says Mr Reid. "But we find our best results come after ploughing." To aid drainage and ploughing, 300 – 400 acres are subsoiled each year during August and September.
This is carried out using a Spaldings Flatlift fitted with auto-trip legs to a depth of 12 – 14 inches, pulled by a 130hp John Deere.

"Before auto-trip was available on the Flatlift it was not uncommon to replace at least 20 shear bolts per day on the stronger land, easily taking two hours out of a working day – downtime we simply could not afford."

"We fitted the auto-trip system ourselves, which involved quite a lot of welding," he says. "We also have the disc cultivation tool bar for going into old potato land in front of the drill."

"Auto-trip means we can increase our forward speed, but the real beauty of the system is that we don't have to keep getting on and off the tractor to replace shear bolts.

The fact that the legs also swivel means that they are not rigid if they hit something solid rather than lifting out of the ground along with whatever has been hit." Mr Reid says "It just does not make sense not to have one, especially on our soil types up here."

Auto-trip Heavy duty hydraulic ram pressurised by a hydro-pneumatic accumulator allows the leg to trip back

Ball joint ram design maintains the Flatlift legs unique capacity to swivel – reducing side stress

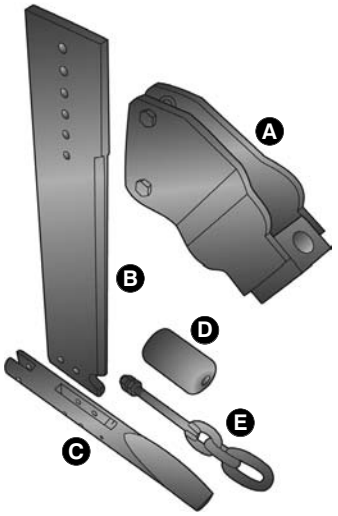
Auto-trip legs can be retro-fitted to existing machines or ordered as standard with new machines

7.4 Mole drainer conversion leg

02200 Mole conversion for diamond bar Flatlift machines. Consisting of:

- 1 x **02198** Flatlift mole hinge **(A)**,
- 1 x **01185** single ended 40" x 8" x 1" mole blade **(B)**,
- 1 x **01187** 3" x 26" mole foot **(C)**,
- 1 x **01188** 3½" expander **(D)**,
- 1 x **01191** coupling **(E)**,
- 3 x **01190** M20 x 65mm double roll pins,
- 1 x **07594** M20 x 100mm 8.8 grade shear bolts (pack of 5),
- 1 x **07058** M20 x 100mm 10.9 grade pivot bolt.

12928 Replacement bush for mole hinge.



A simple, cost effective way of converting your FLATLIFT® from a subsoiler into a mole drainer.

It's simple just remove the Flatlift leg from its hinge, release the hinge pin, replacing the Flatlift hinge with the new mole hinge and leg assembly.

OPTIONS

Fitting between the Flatlift® legs and packer roller, tool bars efficiently mix the top soil and crop residue providing cost-effective single-pass soil conditioning.

"tool bar single-pass savings"

A 3-leg Flatlift and cultivation tool bar is used by Herefordshire farmer Mr Nigel Roper;

"I was particularly pleased with the job the Tool Bar was doing, it adds another dimension to the Flatlift" comments Nigel, "the Flatlift becomes a one pass machine capable of subsoiling and cultivating in one go with the obvious savings in fuel, labour and compaction that another pass would incur.

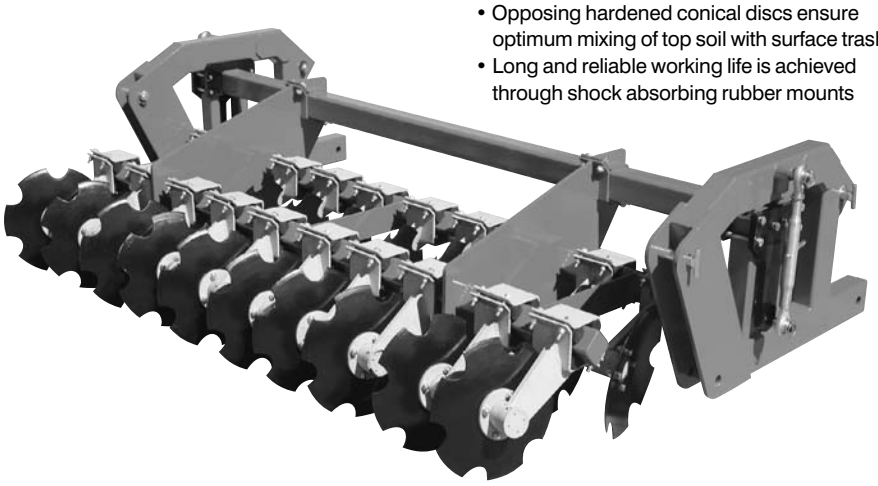
The wings and points have also shown little sign of wear in our abrasive sandy soils.

save fuel, cultivation time and labour costs

7.5 Disc cultivation tool bar

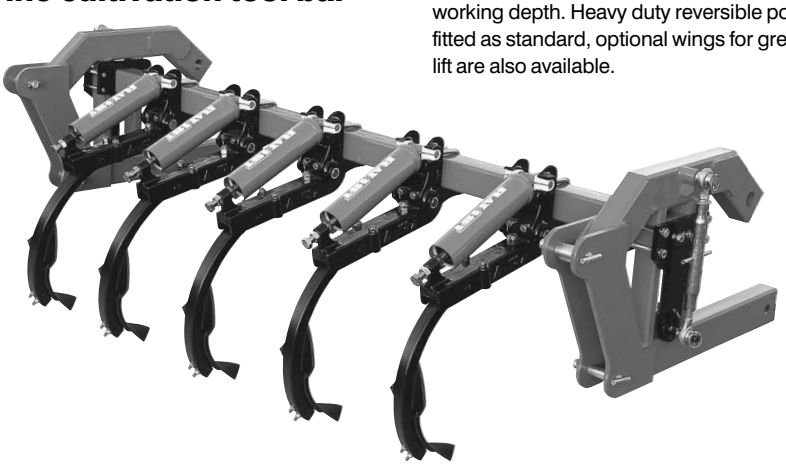
NOW available with up to 24 disc units, the new more efficient Disc tool bars cultivate to 4" with adjustable working depth.

- Opposing hardened conical discs ensure optimum mixing of top soil with surface trash
- Long and reliable working life is achieved through shock absorbing rubber mounts



7.6 Tine cultivation tool bar

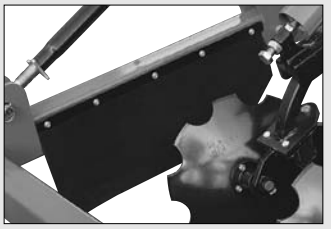
Tine tool bars cultivate to 8" with adjustable working depth. Heavy duty reversible points fitted as standard, optional wings for greater lift are also available.



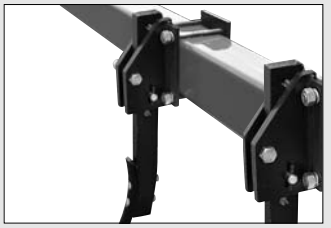
YEAR FRAME 5 WARRANTY

For specification and product numbers see page 7

TOOL BAR OPTIONS:



SIDE DEFLECTOR KIT
For use with disc tool bars; rubber deflector panels fit either side of the packer frame to retain soil within the working width for a neat finish.

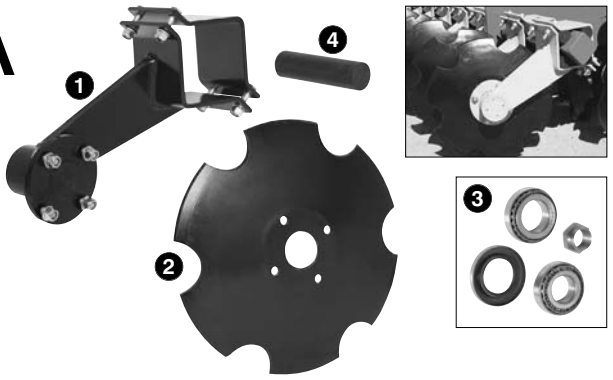


ERADICATOR TINE KITS
Designed to fit the packer roller frame, tine kits can be used with tine tool bars for an extra level finish.

CULTIVATION WINGS
Can be fitted beneath the standard points on tine tool bars for increased penetration and soil disturbance.

7.7 Single-pass tool bar replacement parts

A

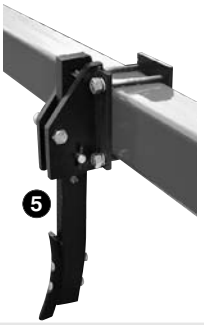


ILLUS. NO.	DESCRIPTION	PROD. NO.

DISC TOOL BAR series 2
Replacement parts

A1	Complete hub and bracket assembly R.H. for series 2 disc tool bar	**12967**
-	Complete hub and bracket assembly L.H. for series 2 disc tool bar	**12968**
A2	16" cutaway disc for series 2 disc tool bar	**12966**
A3	Bearing kit for series 2 disc tool bar	**12969**
A4	Rubber spring for series 2 disc bracket assembly (4 required per assembly)	**12970**

- Used with tine tool bars – eradicator tines fit the Flatlift packer roller for an extra level finish



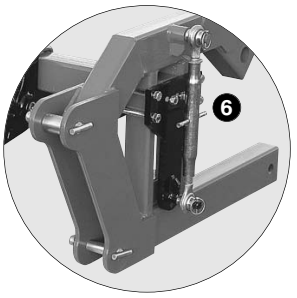
ILLUS. NO.	DESCRIPTION	PROD. NO.

ERADICATOR TINES

A5	6 Tine kit	**12786**
A5	7 Tine kit	**12833**
A5	8 Tine kit	**12808**

Replacement parts

-	Ripper tine	**11344**
-	2 hole point	**05370**
-	M10 x 70mm bolt & nut (Pk 10)	**09192**
-	Eradicator tine pin	**08880**
-	Shear bolt & nut (Pk 10)	**08881**
-	4mm 'R' clip (Pk 30)	**07626**
-	Eradicator tine bracket assembly (fits 120 x 80mm)	**12790**



ILLUS. NO.	DESCRIPTION	PROD. NO.

TOOL BAR
Replacement parts

-	Centre bar for 2.85m tool bars	**12954**
-	Bolt for 12954	**12956**
A6	Tool bar turnbuckle	**12955**
-	Tool bar end bracket R.H.	**12953**
A6	Tool bar end bracket L.H.	**12972**

B

ILLUS. NO.	DESCRIPTION	PROD. NO.

TINE TOOL BAR
Replacement parts

-	Complete cultivation **tine** assembly c/w heavy duty point (items A1, 2 & 3)	**12817**
B1	Replacement complete upper tine and spring assembly	**12772**
B2	Replacement lower tine to fit 12772	**12763**
B3	Heavy duty reversible point	**02107**
-	7/16 x 65mm fastener to fit 02107 (Pack of 10)	**09207**
B4	One piece cultivator wing	**19077**
-	7/16 x 75mm fastener to fit 19077 (Pack of 10)	**09208**
B5	Frame to upper tine clamp (2 required)	**12771**
B6	Upper to lower tine eye bolt and U-bolt	**12770**
B7	Pivot pin for 12772	**12778**
B8	Bush for pivot pin 12778 (1 pair)	**12777**
B9	Tube socket bush for 12772 (single)	**12776**

ILLUS. NO.	DESCRIPTION	PROD. NO.

DISC TOOL BAR (Pre-2009)
Replacement parts

-	Complete cultivation **disc** tine assembly (items A1 & A10)	**12816**
B1	Replacement complete upper tine and spring assembly	**12772**
B10	Replacement lower tine c/w 460mm (18") dual discs and hub assembly to fit 12772	**12781**
-	Lower tine only, to fit disc bracket	**12789**
-	Hub & bracket assembly to fit 12781	**12788**
-	460mm (18") cuttaway disc	**12787**
-	Disc bearing kit to fit 12781	**12800**
B11	Disc hub (single) c/w fasteners	**12919**
B5	Frame to upper tine clamp (2 required)	**12771**
B6	Upper to lower tine eye bolt & U-bolt	**12770**
B7	Pivot pin for 12772	**12778**
B8	Bush for pivot pin 12778 (1 pair)	**12777**
B9	Tube socket bush for 12772 (single)	**12776**

ILLUS. NO.	DESCRIPTION	PROD. NO.

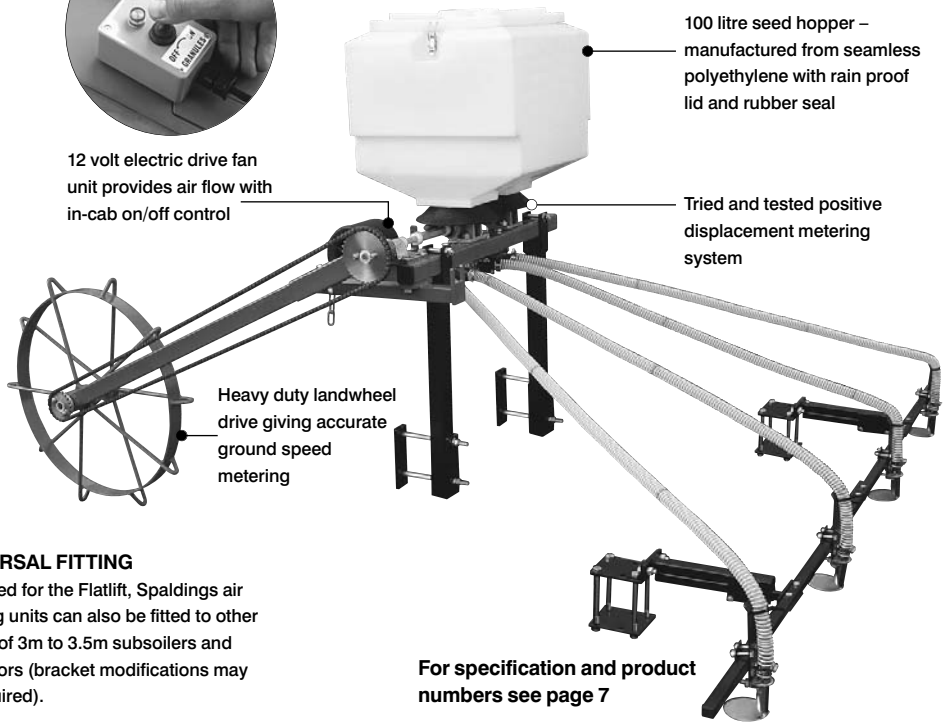
DEFLECTOR KIT
for Disc Tool Bars

Attach the rubber deflector panel to either side of the Flatlift Packer frame to retain surface soil within the working width for a neat finish.

B12	Side deflector kit for disc tool bars. Consists of 2 rubber deflectors complete with fixings.	**12830**
B12	Replacement rubber deflector	**12831**

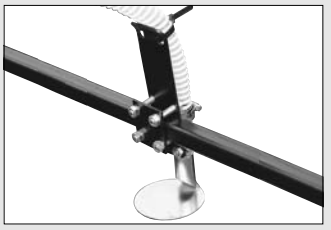
7.8 Air seeding unit

A fluted roller system ensures that seed is delivered evenly through air vents into cultivated soil.
A 12 volt electric drive fan provides airflow with in-cab control, while the heavy duty landwheel drive gives accurate ground speed metering.

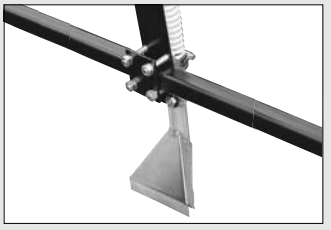

100 litre seed hopper – manufactured from seamless polyethylene with rain proof lid and rubber seal
12 volt electric drive fan unit provides air flow with in-cab on/off control
Tried and tested positive displacement metering system
Heavy duty landwheel drive giving accurate ground speed metering

UNIVERSAL FITTING
Designed for the Flatlift, Spaldings air seeding units can also be fitted to other makes of 3m to 3.5m subsoilers and cultivators (bracket modifications may be required).

For specification and product numbers see page 7



STANDARD AIR SEEDING UNIT – suited to establishment systems where a tilth is desirable (illustrated).
The standard seeding unit for use with cultivation tool bars features a 100 litre seed hopper with four seed outlets and deflector plates to ensure seed is spread accurately into cultivated soil before the packer roller.



NARROW BAND AIR SEEDING UNIT for oil seed rape – most suited to drier conditions where minimum soil cultivation is required.
The new seeder unit is based on the existing positive displacement feed roller design. It is available with two 100 litre hoppers and up to eight seed outlets which deliver seed in bands directly behind the subsoiler legs before the packer roller.

NB. The air seeding unit is not suitable for grass seed

cost-effective seed placement

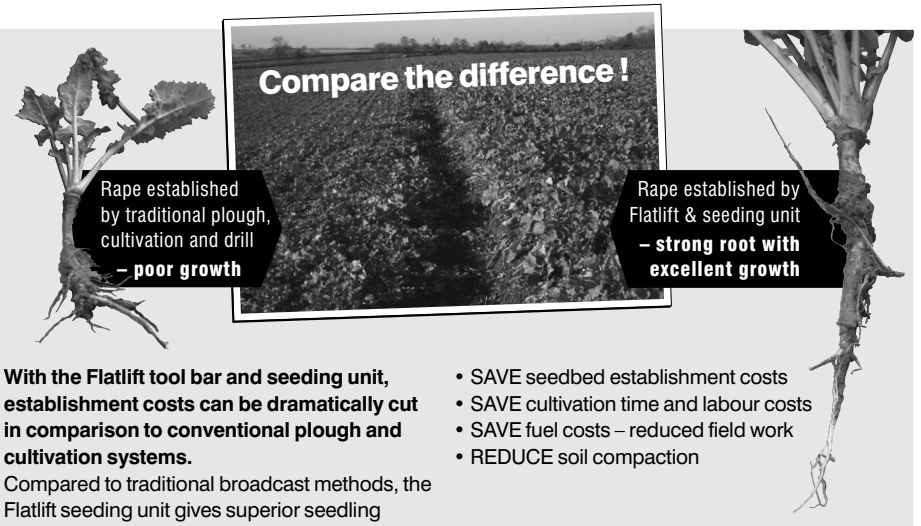
"Seeder unit cuts cost of oil seed rape establishment"

A 3-leg Flatlift with tool bar and seeder unit is used for rape establishment by Northants farmer Mr Hutchinson. He describes how two main aims guided him in the choice of a Flatlift seeder system.

"The primary motivation was to significantly reduce our oil seed rape crop growing costs by combining multiple operations into one and improve our soil structure which is critical for oil seed rape."

"In reality, subsoil conditioning, surface cultivation, seeding and consolidation with just one tractor and driver enabled us to remove several passes from our rape establishment system. As well as saving money the Flatlift legs shatter compaction and help condition the soil structure getting the crop off to the best possible start."

"In fact crops sown with conventional multiple-pass systems struggled significantly to germinate as critical moisture was lost during multiple cultivations in a difficult season."


Compare the difference !
Rape established by traditional plough, cultivation and drill – poor growth
Rape established by Flatlift & seeding unit – strong root with excellent growth

With the Flatlift tool bar and seeding unit, establishment costs can be dramatically cut in comparison to conventional plough and cultivation systems.
Compared to traditional broadcast methods, the Flatlift seeding unit gives superior seedling establishment and tap root development for increased yield potential.

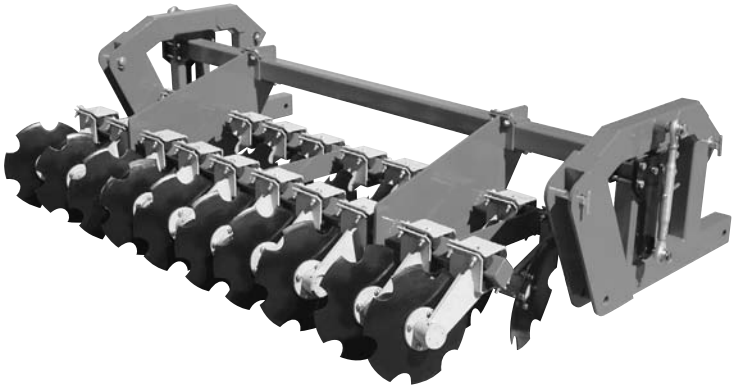
- SAVE seedbed establishment costs
- SAVE cultivation time and labour costs
- SAVE fuel costs – reduced field work
- REDUCE soil compaction

Reduce the cost of oil seed rape establishment with Flatlift®

8.0 Tool bar to Flatlift® attachment

Please note this procedure requires the use of suitable lifting equipment.

1. If necessary remove packer roller from Flatlift®.
2. Securely attach slings to the tool bar, around the spring assemblies, to enable the tool bar to be lifted in a safe level manner.
3. Fit the eccentric bush in the upper front holes of the tool bar.
4. Lift the tool bar and offer up to the rear brackets of the Flatlift®.
5. Align the lower holes first and secure with the pins.
6. Align the top holes as close as possible using the forklift. Using a pry bar, rotate and align the eccentric bushes and secure with the pins.
   DO NOT ATTEMPT TO ALIGN OR ROTATE THE BUSHES USING FINGERS.



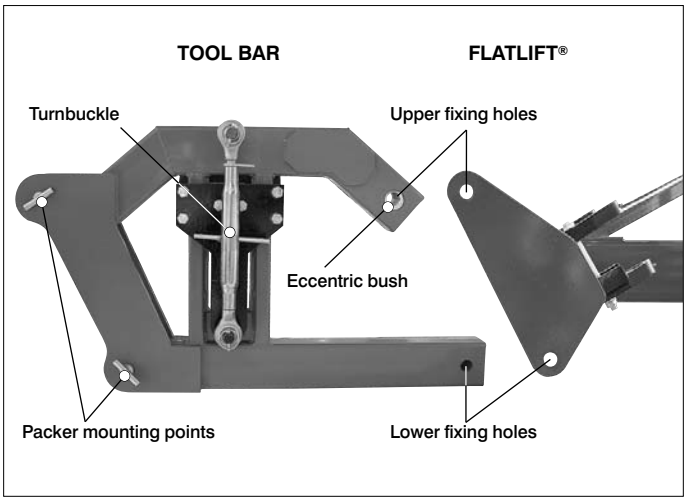


Fig.2 Tool bar to Flatlift attachment

SINGLE-PASS TOOL BARS

8.1 Tool bar operation and adjustment

The working height of the tines or discs can be adjusted independent to the Flatlift® and Packer as follows:–

1. First set the Flatlift® to the required working depth.
2. Slightly loosen the 4 clamp bolts at each end of the tool bar.
3. Rotate the turnbuckle on the side of the tool bar to either raise or lower the tool bar as required. It is necessary to either turn the adjusting bars simultaneously (requiring 2 people) or to turn each bar a number of revolutions in sequence.
4. Once at the required height, re-tighten the 4 clamp bolts at each end of the tool bar firmly.
5. UNDER NO CIRCUMSTANCES ATTEMPT TO USE THE TOOL BAR WITHOUT THE CLAMP BOLTS FIRMLY TIGHTENED.
6. Once in operation observe the action of the tines and adjust the spring tension screws so that a little movement can be observed on the tines.

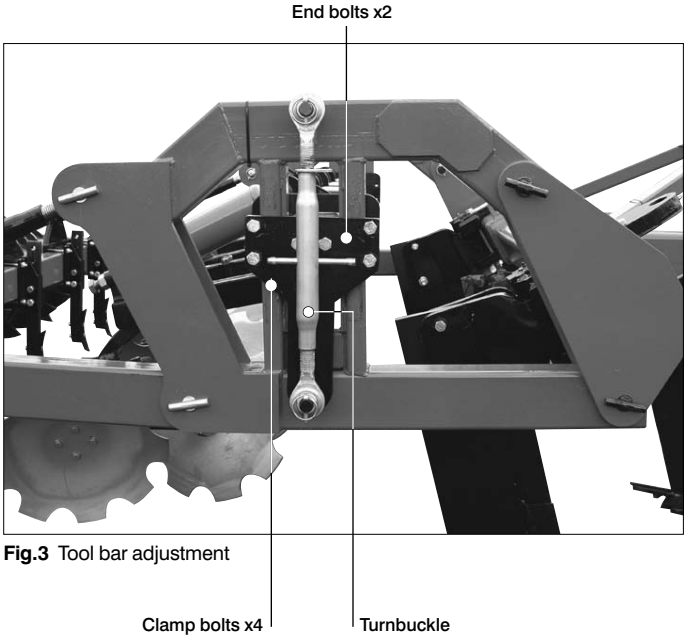


Fig.3 Tool bar adjustment

8.2 Tool bar maintenance

Essential maintenance and operation points:–

1. Grease turnbuckle screw threads and ensure that the thread is kept protected with a coating of grease.
2. Grease the grease points daily
3. Ensure the end bolts on the height adjustment are kept tight at all times.
4. Ensure the clamp bolts on the height adjustment are kept tight at all times.
5. Check all tine assembly bolts on a daily basis.
6. Grease tine disc assemblies on a daily basis.
7. Replace any worn parts immediately.

8.3 Tool bar specification

TOOL BAR MODEL	DIMENSIONS L	W	H	WEIGHT BARE FRAME	WITH TINES	WITH DISCS	MAX WORKING DEPTH WITH TINES	WITH DISCS	POWER REQ. PER TINE / DISC
TOOL BARS									
2.85m	1.2m	2.85m	1.54m tines	220kg	430kg	545kg	0 – 200mm (8")	0 – 100mm (4")	5 – 10hp
3.5m	1.2m	3.5m	1.45m tines	222kg	-	612kg	-	0 – 100mm (4")	5 – 10hp

NOTES

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Flatlift Inst: 02.2010